

What is claimed is:

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1. A book trimmer (1) for trimming the edges of a perfect bound book (B), the latter comprising a plurality of text pages (P) and a cover (C), said book having major and minor edges of predetermined dimensions one of said major edges constituting a spine (S) along which said text pages are bound to said cover, said trimmer having a selectively actuatable blade (15) movable between an open position and a blade platen and a closed position in which said book is sheared along a shearing plane (SP), said book trimmer being characterized by a holder (35) for gripping said book as said book is trimmed, a carriage (23) supporting said holder, said carriage along with said book held by said holder being movable with respect to said blade between a first position in which a first edge (M1) of said book may be trimmed, and a second position in which a second edge (M2) of said book may be trimmed, such that with said book in one of its said positions a respective edge is positioned with respect to said shearing plane such that upon actuation of said blade a predetermined amount of said book is trimmed from said respective edge.

2. A book trimmer as set forth in claim 1 wherein said carriage is movable to a third position in which a third edge (M3) of said book may be trimmed.

3. A book trimmer as set forth in claim 1 or 2 wherein with said carriage along with said holder and a book gripped thereby is in one of said positions, said carriage is movable toward and away from said shearing plane a predetermined amount so that a predetermined amount may be trimmed from said book.

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4. A book trimmer as set forth in claim 3 wherein said book is oriented in a substantially vertical plane, and wherein said shearing plane is substantially horizontal.

5. A book trimmer as set forth in claim 4 wherein with said one edge of said book resting on said blade a reference position is established, said holder gripping said book between said first and second minor edges proximate said spine.

6. A book trimmer as set forth in claim 5 wherein with said holder gripping said book proximate said spine substantially equidistantly between said minor edges, said carriage moving said book relative to said reference position so as to position said first edge of said book relative to said shearing plane such that a predetermined amount will be trimmed from said book along said one edge upon actuation of said blade.

7. A book trimmer as set forth in claim 6 wherein said holder is rotatable with respect to said carriage such that said book is rotated approximately 180° as said carriage moves from its first to its second position thereby to orient said second edge relative to said shearing plane for trimming said second edge, and wherein said holder is rotatable approximately 90° with respect to said carriage as said carriage moves from its second to its third position thereby to orient said third edge relative to said blade for trimming said third edge.

8. A book trimmer as set forth in claim 7 wherein said third position is intermediate said first and second positions.

9. A book trimmer as set forth in claim 7 further wherein said trimmer further comprises an actuator for raising and lowering said carriage relative to said shearing plane so as to position said edges of said book relative to said shearing plane such that upon actuation of said shearing blade said predetermined amount.

being movable toward and away from said blade so as to position said book with respect to said blade, such that said with said carriage in its said first, second and third positions, said first, second and third edges of said book are positioned with respect to said shearing plane such that predetermined amounts of said book may be trimmed from said first, second and third edges thereby to produce a book trimmed to its predetermined finished dimensions.

13. A book trimmer as set forth in claim 12 further comprising an indexing mechanism for shifting said carriage between its first, second and intermediate positions.

14. A book trimmer as set forth in claim 12 wherein said book is oriented in a substantially vertical plane as said first, second and third edges are trimmed, wherein said blade moves substantially horizontally as said first, second and third edges are trimmed, and wherein with said blade in its closed position, said one edge of said book engages the face of said blade thereby to establish a reference position for said book with respect to said shearing plane.

15. A book trimmer as set forth in claim 14 wherein with said one edge of said book resting on said blade in said reference position, said holder gripping said book between said first and second edges proximate said spine.

16. A book trimmer as set forth in claim 15 wherein with said holder gripping said book between said first and second edges and with said blade in its open position, said carriage moving said book relative to said shearing plane so as to position said first edge of said book such that a predetermined amount will be trimmed from said book along said shearing plane upon actuation of said blade.

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17. A book trimmer as set forth in claim 16 wherein said holder is rotatable with respect to said carriage such that said book is rotated approximately 180° as said carriage is moved from its first to its second position thereby to orient said second edge relative to said shearing plane for trimming said second edge, and wherein said holder is rotatable approximately 90° with respect to said carriage as said carriage is moved from its second to its third position thereby to orient said third edge relative to said trimming blade for trimming said third edge.

18. A book trimmer as set forth in claim 17 wherein said third position is intermediate said first and second positions, and wherein with said carriage in its said third or intermediate position, said carriage is substantially centered between said first and said second positions.

19. A book trimmer as set forth in claim 17 further comprising an actuator for raising and lowering said carriage relative to said shearing plane.

20. A book trimmer as set forth in claim 19 wherein said actuator is actuated when said book is in its said second position thereby to position said second edge of said book relative to said shearing plane such that upon actuation of said shearing blade a predetermined amount of said book along said second edge is trimmed.

21. A book trimmer as set forth in claim 20 wherein said actuator is actuated when said book is in its said third position thereby to position said third edge of said book relative to said shearing plane such that upon actuation of said shearing blade a predetermined amount of said book along said third edge is trimmed.

22. A book trimmer as set forth in claim 18 further comprising a guide engageable with said holder as said holder is moved into its said third or intermediate

position thereby to position said one major dimension edge of said book relative to said shearing plane .

23. A book trimmer as set forth in claim 12 wherein said shearing plane is a horizontal plane and wherein said book is oriented vertically with respect to said shearing plane, with said trimming blade in its closed position and with said carriage in its said first position, said one minor edge of said book to be trimmed may be abutted against said trimming blade thereby to establish a reference position for the book to be trimmed.

24. A book trimmer as set forth in claim 23 wherein with said blade in its closed position, with said one minor edge of said book in engagement with said blade, and with said holder loosely gripping said book, said carriage along with said holder being movable relative to said book so as to position said holder relative to said book so as to grip said book proximate the spine of said book substantially equidistant between said minor edges of said book.

25. A book trimmer as set forth in claim 24 with said holder gripping said book at said position substantially equidistantly between said minor edges, with said one minor edge of said book in the vertical position it was when it was in engagement with said blade, and with said blade in its open position, wherein said carriage is moved vertically relative to said horizontal shearing plane of said blade so that said book is positioned relative to shearing plane such that a predetermined amount of said book along said one minor edge is positioned relative to the shear blade for being trimmed from said book upon closing of said shear blade.

26. A book trimmer as set forth in claim 25 wherein prior to actuation of said shear blade with said book in said second position, said carriage being moved vertically relative to said horizontal shearing blade so that said book is positioned relative to said shear plane such that a predetermined amount of said book along said second minor edge is positioned relative to the shear blade for being rimmed from said book upon closing of said shear blade.

27. A book trimmer as set forth in claim 26 wherein prior to actuation of said shear blade with said book in said third position, said carriage being moved vertically relative to said horizontal shearing blade so that said book is positioned relative to said shear plane such that a predetermined amount of said book along said one major edge is positioned relative to the shear blade for being rimmed from said book upon closing of said shear blade.

28. A book trimmer as set forth in claim 12 wherein a first stop is positioned relative to said holder for engagement by said carriage as the latter moves into its said first position for positioning said holder in its said first position, a second stop positioned relative to said holder as the latter moves into its said second position for positioning said holder in its said second position, and a third stop positioned relative to said holder for engagement by said holder as the latter moves into its said third position for accurately positioning said holder at said third position.

29. A book trimmer as set forth in claim 12 further comprising a controller for controlling operation of said carriage as the latter moves between its first, second and third position, for controlling said holder as the latter grips said book, for controlling operation of said carriage to move toward and away from said shearing plane, and for

controlling operation of said shear blade so as to trim said first, second and third edges of said book.

30. A book trimmer as set forth in claim 28 wherein said predetermined finished dimensions of said book are known to said controller such that with said book in said first, second and third positions, said controller determines the amount of said book along said first, second and third edges to be trimmed so as to result in said finished book of said predetermined finished dimensions.

31. Apparatus for trimming a perfect bound book to a predetermined rectangular size, said perfect bound book having a multiplicity of pages and a cover, said book having first and second minor edges to be trimmed and one major edge to be trimmed, the other major edge of said book constituting a spine along which said pages are bound to said cover, said book before trimming having a major dimension ranging up to a maximum major dimension and said book having a minor dimension ranging up to a maximum minor dimension, said book being trimmed to predetermined major and minor finished dimensions, said apparatus having a trimming blade and a blade platen with the blade being movable in horizontal direction relative to said platen between a retraced position in which said book to be trimmed may be inserted between said blade and said platen and a cutting position in which said book is trimmed between said blade and said platen along a horizontal shearing plane, a holder for gripping said book, a carriage carrying said holder movable horizontally relative to said blade between a first position in which a first minor edge of said book is to be trimmed to a second position in which a second minor edge of said book is to be trimmed and a third position in which one major edge of said book is to be trimmed, said carriage being vertically movable

with respect to said shearing plane thereby to position said edges relative to said shearing plane such that predetermined amounts of said book along said first and second minor edges and along said one major edge may be trimmed therefrom so as to produce said book or predetermined finished dimensions, and a control system for
5 controlling operation of said holder, said carriage and said shear blade, the finished dimensions of said finished book being known to said control system such that the latter positions said first and second minor edges and said one major edge relative to said shear plane when said carriage is in its first, second and third positions, respectively, so as to trim portions of said book along said first and second minor edges and along said one major edge thereby to result in a trimmed book having said predetermined finished dimensions.

32. Apparatus for trimming a book as set forth in claim 31 wherein with said shear blade in its closed position and with said one minor edge of said book in engagement with said blade thereby to establish a reference position for said book
15 relative to said shear plane, said carriage being movable vertically with respect to said book such that said holder may grip said book substantially equidistantly between said minor edges proximate said spine, and wherein with said book held by said holder in said equidistant position and with said blade open, said carriage under the control of said controller being vertically movable so as to position said first edge of said book
20 relative to said shearing blade such that upon actuation of said shearing blade a predetermined amount of said book will be sheared therefrom along said first minor edge, said controller effecting movement of said carriage from said first to said second position with said book being rotated about 180 ° from its said first position such that

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said second minor edge of said book is disposed to be trimmed by said trimming blade, said controller effecting vertical movement of said carriage relative to said shearing plane as required to effect trimming of a predetermined amount of said book is trimmed from said second minor edge of said book upon actuation of said blade, and said
5 controller effecting movement of said carriage to said third position with said book being rotated about 90° from its second position such that said one major edge of said book is disposed to be trimmed by said trimming blade, said controller effecting vertical movement of said carriage relative to said shearing plane as necessary to effect trimming of a predetermined amount of said book from said one major edge upon actuation of said shear..

33. Apparatus for trimming a book as set forth in claim 32 wherein said indexing mechanism effects rotating of said holder relative to said carriage through an angle of rotation of approximately 180° as said carriage is moved from its said first to its said second position thereby to position said second edge of said book relative to said trimming blade, and said indexing mechanism further effects rotating of said holder through and angle of rotation of approximately 90° as said carriage is moved from its said second to its said third position thereby to position said third edge of said book relative to said trimming blade.

34. A book trimming apparatus as set forth in claim 33 wherein said indexing
20 mechanism comprises a crank having an arm pivotally connected to said holder and a linear actuator connected to said carriage movable from a first position in which said carriage is in its said first position to a second position in which said carriage is in its said second position to a third position in which said carriage is in its said third position.

35. Apparatus as set forth in claim 34 wherein said linear actuator comprises a fluid cylinder

36. Apparatus as set forth in claim 34 having a frame supporting said carriage, said frame having a first stop engageable by said carriage with said carriage thereby to positively locate said carriage as the latter moves into its said first position, and a second stop carried by said frame engageable by said carriage thereby to positively locate said carriage as the latter moves into its said second position, and a third stop carried by said frame engageable by said carriage as the latter moves into its said third position thereby to positively locate said carriage in its said third position.

37. Apparatus as set forth in claim 32 having a frame supporting said carriage, said frame being mounted on guides for vertical movement of said carriage and of said holder gripping said book toward and away from the horizontal shearing plane of said blade, and an actuator for effecting vertical movement of said carriage toward and away from the horizontal shearing plane of said blade thereby to vertically position said edges of said book gripped by said holder with respect to said blade such that said predetermined amounts of said book may be accurately trimmed from said first, second and third edges of the book as said carriage and said book carried thereby is in its said first, second and third positions.

38. Apparatus as set forth in claim 37 wherein with said carriage in its said first position, said vertical movement actuator is operated to accurately position said first edge of said book relative to said horizontal shearing plane such that said predetermined amount of said book along said first edge is trimmed from the book upon actuation of said shearing blade.

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39. Apparatus as set forth in claim 37 wherein with said carriage in its said second position, said vertical movement actuator is operated to accurately position said second edge of said book relative to said horizontal shearing plane such that said predetermined amount of said book along said second edge is trimmed from the book upon actuation of said shearing blade.

40. Apparatus as set forth in claim 37 wherein with said carriage in its said third position, said vertical movement actuator is operated to accurately position said third edge of said book relative to said horizontal shearing plane such that said predetermined amount of said book along said third edge is trimmed from the book upon actuation of said shearing blade.

41. Apparatus as set forth in claim 37 wherein said shear blade includes a guide for directing said pages of said book to be trimmed into the space between said blade and said platen.

42. A book trimming apparatus for trimming a perfect bound book, the latter being of a rectangular configuration having a major dimension and a minor dimension, said perfect bound book being bound along one major edge constituting the spine of said book wherein one of said major edges and both of said minor edges are to have predetermined amounts trimmed therefrom so as to produce a trimmed book of a predetermined finished height and width, said apparatus having a frame, a trimming blade carried by said frame cooperable with a blade platen selectively movable between an open position in which a portion of said book to be trimmed may be inserted between said blade and said platen, a vertical track, a carriage movable on said vertical track toward and away from said blade, a drive for accurately moving said carriage along said

vertical track to substantially any desired position along said vertical track, said carriage having a horizontal track movable with said carriage, a book holder carried by said carriage, said book holder gripping a book to be trimmed along proximate said spine, said holder being rotatable with respect to said carriage, said carriage being movable in
5 horizontal direction with respect to said blade between a first position in which a first minor edge of said book may be trimmed to a second position in which the other minor edge is trimmed, said book being rotated about 180 ° as it is moved from said first to said second position, and said carriage being further movable from said second position to a third position in which said one major edge of said book is disposed relative to said blade for being trimmed, said book being rotated about 90 ° from its second position.

43. Apparatus for trimming a bound book to a predetermined finished size, said book having a cover and a plurality of text pages, said book having a spine along one edge thereof, top and bottom edges substantially perpendicular to said spine, and an outer edge substantially parallel to said spine, said apparatus comprising a frame, a
15 book shearing mechanism carried by said frame, said shearing mechanism having a shear blade movable in a horizontal shearing plane between a retracted position in which said book may be moved into position for being trimmed by said blade and a closed position in which said blade engages the book and shears said book, a holder for gripping said book and for holding the book as its edges are trimmed to a
20 predetermined finished size, said holder being mounted for rotation about a horizontal axis, said book holder being movable in a horizontal direction relative to said blade such that said book is moved laterally with respect to said trimming blade, and an indexing mechanism for moving said book holder and for rotating said book holder and said book

gripped thereby from a first position in which said book is positioned for having a predetermined amount trimmed from one edge thereof to a second position in which said book is positioned for having a predetermined amount trimmed from a second edge thereof, and for moving said book holder and for rotating said holder and said book gripped thereby from said second position to a third position in which said book is positioned relative to said blade for having a predetermined amount trimmed from a third edge thereof thereby to produce a finished and trimmed book of said predetermined size.

44. A method of trimming a perfect bound book (B) to a predetermined finished size, said book being of generally rectangular shape having a major dimension and a minor dimension, said book having a plurality of text pages (P) and a soft cover (C), said book being perfect bound along one major edge constituting a spine (S), said book having predetermined margins (M) to be trimmed from at least two edges of said book, said method being characterized by the steps of:

- a. gripping said book proximate said spine such that said book is substantially perpendicular to a shear blade as the latter is moved between an open position and a shearing position;
- b. with a first edge of said book disposed in position to be trimmed by said blade, and with said blade in its open position, moving said book relative to said blade such that a predetermined amount of said book along said one edge is positioned relative to said blade so as to be trimmed upon closing of said blade;
- c. effecting operation of said blade so as to trim said predetermined amount from said one edge of said book;

d. rotating said book so as to dispose another edge of said book relative to said blade for being trimmed;

e. moving said book relative to said blade such that a predetermined amount of said book along said other edge is positioned relative to said blade so that said second edge is positioned relative to said blade so as to be trimmed from said book upon closing of said blade; and

f. effecting operation of said blade so as to trim said predetermined amount from said other minor edge of said book.

45. The method of claim 44 wherein said method is further characterized by the steps of:

g. rotating said book so as to dispose a third edge of said book relative to said blade for being trimmed; and

h. effecting operation of said blade so as to trim said predetermined amount from said third edge of said book.

46. The method of claim 45 further comprising the steps of moving said book laterally with respect to said blade as said book is rotated from its first to its second position.

47. The method of claim 46 further comprising the step of moving said book laterally with respect to said blade as said book is rotated from its second to its third position.

48. The method of claim 47 wherein said third position is intermediate to said first and second positions.

- h. actuating said shear blade to trim said predetermined amount from said side edge; and
- i. releasing said trimmed book.

50. A method of trimming a perfect bound book to a predetermined finished size, said book being of generally rectangular shape having a major dimension and a minor dimension, said book having a plurality of text pages and a soft cover, said book being perfect bound along one major edge, said book having predetermined amounts to be trimmed from said minor edges and from said major edge, said book to be trimmed having a predetermined maximum thickness, said method comprising the steps of:

a. gripping said book such that said book is substantially perpendicular to a shear blade as the latter is moved between an open position and a shearing position;

b. with a first minor edge disposed in position to be trimmed by said blade and with said blade in its open position, moving said book relative to said blade such that a predetermined amount of said one minor edge is positioned to be trimmed from said book;

c. effecting operation of said trimming blade so as to trim said predetermined amount from said one minor edge of said book;

d. rotating said book so as to dispose the other minor edge of said book relative to said blade for being trimmed;

e. moving said book relative to said blade such that a predetermined amount of said other minor edge is positioned to be trimmed from said book;

f. effecting operation of said trimming blade so as to trim said predetermined amount from said other minor edge of said book;

g. rotating said book so as to dispose said one major edge of said book relative to said blade for being trimmed; and

h. effecting operation of said trimming blade so as to trim said predetermined amount from said major edge of said book.

51. The method of claim 50 further comprising the steps of moving said book laterally with respect to said blade as said book is rotated from its first to its second position.

52. The method of claim 51 further comprising the step of moving said book laterally with respect to said blade as said book is rotated from its second to its third position.

53. The method of claim 52 wherein said third position is intermediate to said first and second positions.

54. A method of trimming three edges of a perfect bound book to a predetermined finished size, said perfect bound book having a cover and a plurality of pages, said book being generally rectangular, said cover and pages being bound to one another along one edge of the book, said one edge constituting a spine, said having top and bottom edges generally perpendicular to said spine and an outer edge generally parallel to said spine, said method comprising the steps of:

(a) placing said book to be trimmed in a holder with the bottom edge of said book projecting downwardly and with said book being gripped by said holder proximate said spine;

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- (b) moving said book vertically so that a predetermined amount of said book along said bottom edge is positioned for being trimmed from said book;
- (c) actuating a shear blade movable in a generally horizontal shearing plane to trim said predetermined amount from said bottom edge of said book;
- 5 (d) moving said book from said first position to a second position in which the top edge of said book projects downwardly toward said shearing plane;
- (e) moving said book vertically so that a predetermined amount of said book along said top edge is positioned for being trimmed from said book;
- (f) actuating said shear blade to trim said predetermined amount from said top edge of said book;
- (g) moving said book from said second position to a third position in which said side edge of said book so that a predetermined amount of said book along said side edge is positioned for being trimmed from said book;
- (h) actuating said shear blade to trim said predetermined amount from said side edge; and
- (i) releasing said trimmed book.